OAP/CDA Activities and Results

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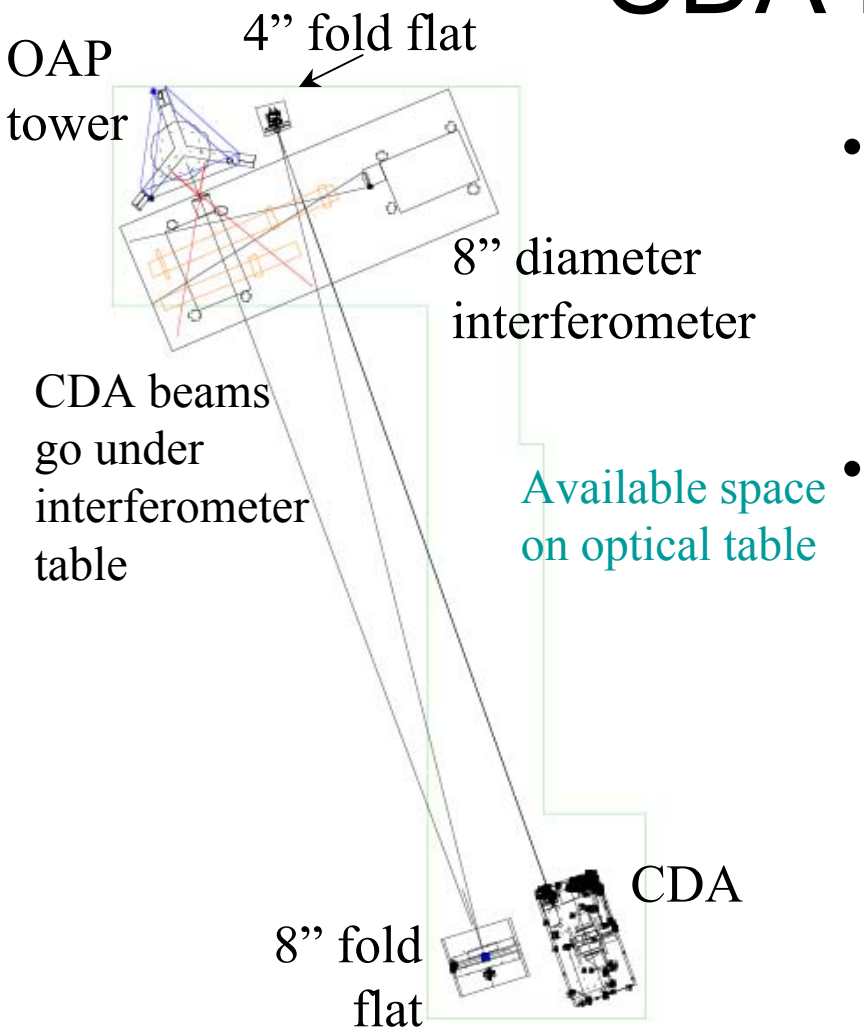
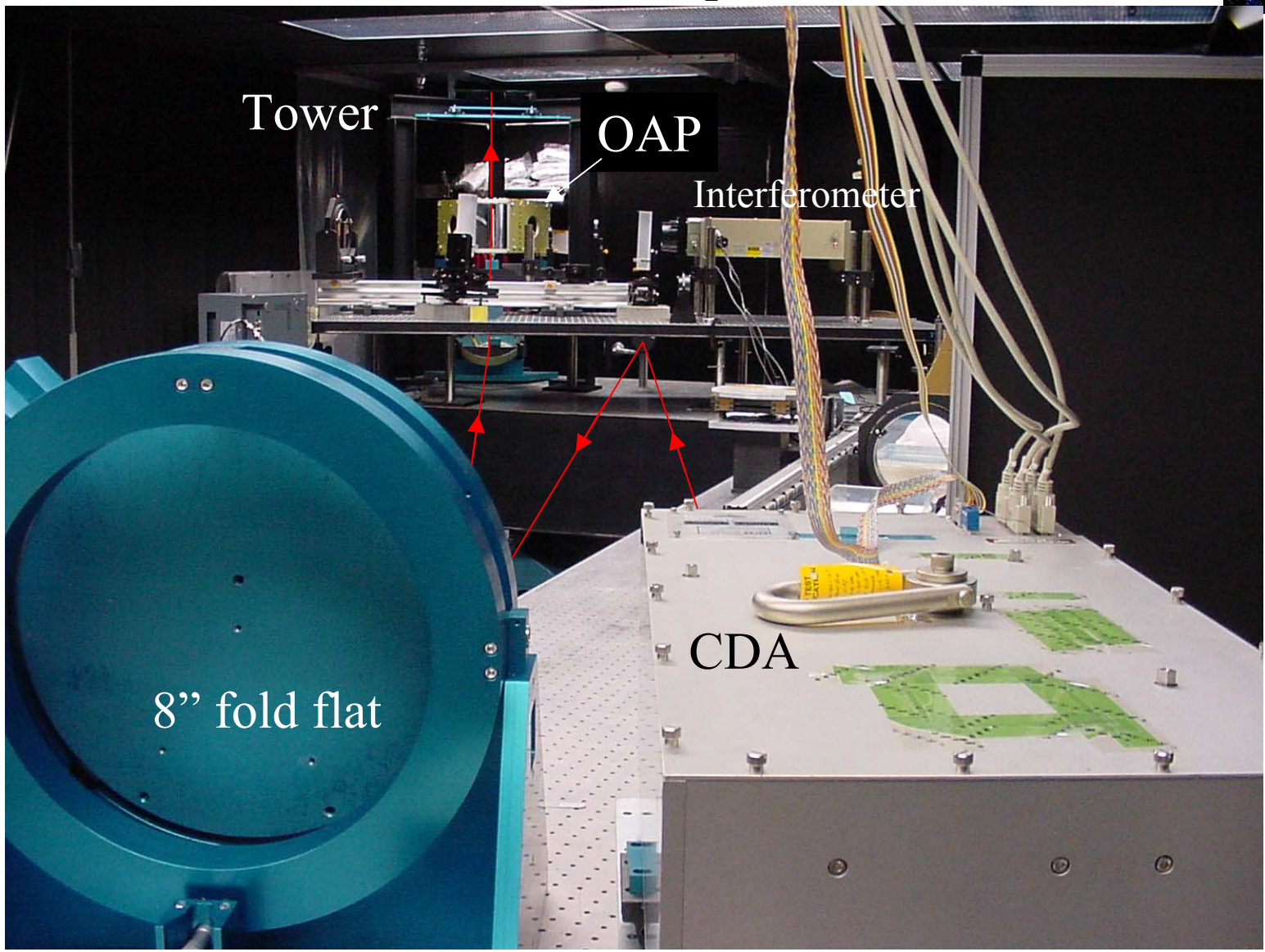
CDA Layout

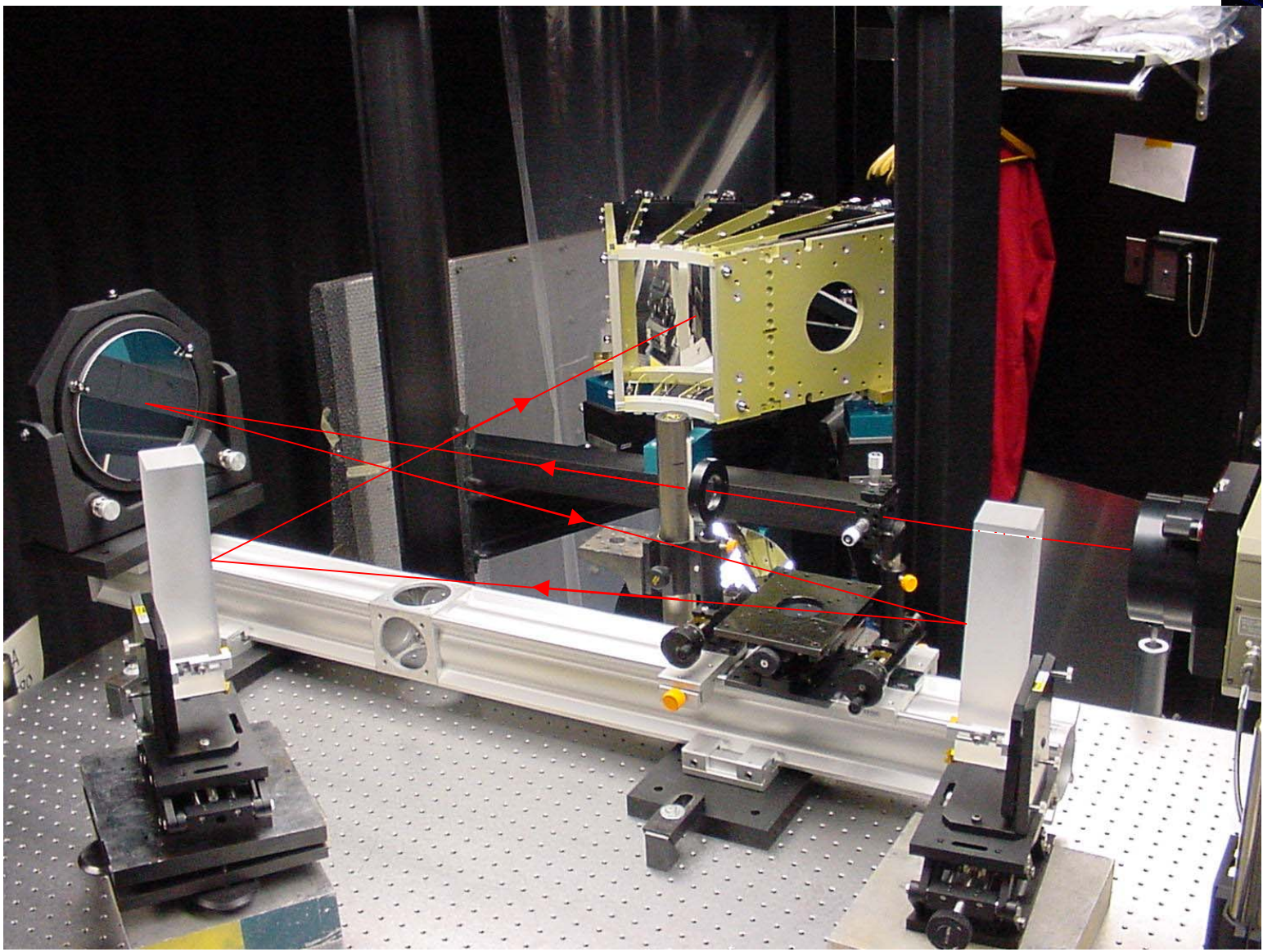


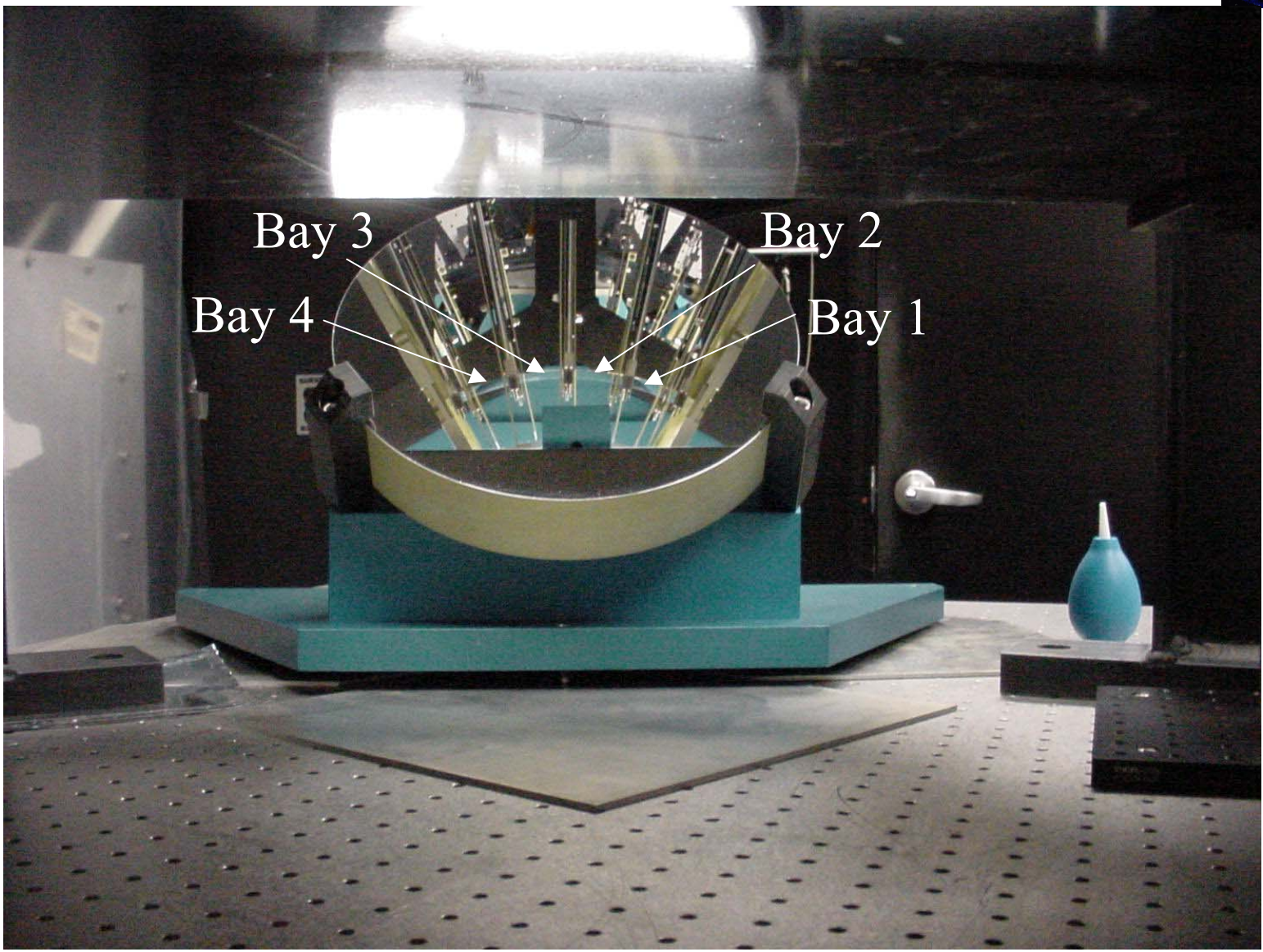
- CDA, OAP and tower mounted on vibration isolated table in Building 5 darkroom
- 16.8 m and 8.4 m focal lengths available with single setup

CDA Beam path



Interferometer for axial figure measurement




Bay 3
Bay 2
Bay 4
Bay 1

Activities so far…

- Integrated all CDA/OAP hardware in E90
- Aligned CDA and interferometer to silvered test Con-X substrate
- Found what works and doesn't work in our alignment procedure and compensated
- Replaced uncoated retro-flat with coated mirror
- Compensated for internal ghost images in CDA

Results so far…

- Have CDA software written to be able to quickly move from one azimuth along x-ray optic to another
- Shown that we can adjust the test substrate using the OAP housing to at least roughly align different azimuthal positions to the same focal point
  - Able to to turn an “upside down” paraboloid into a “right side up” paraboloid
  - Illustrates resilience of glass substrates to large figure changes
- Shown that large changes in the slope angle at one azimuthal position does not significantly change the slope angles of other positions
- Shown that radial focal position can be controlled using OAP micrometers in differential mode (e.g., push top in/pull bottom out)
- Shown that tangential focal position can be controlled using OAP micrometers in common mode (e.g., push or pull both top and bottom together). This changes the local radius of curvature.

Next experiments

- Sept 23 - Oct 4
  - Install aperture plate to stop beam down so that we can do centroiding
  - Setup software for new positions in aperture plate
  - Test alignment procedure using silvered glass substrate
- Oct 7 - 18
  - Install and align real “P” replica in OAP housing using CMM to place optic at designed position
  - Align “P” replica in OAP-P housing using CDA
- Oct 21 - Nov 1
  - Install “H” replica in OAP-H housing and combine with aligned OAP-P.
  - Align P+H combination using CDA